

WG 03/059780

**10/501849**

DT18 Bonn POSTPTD 17 JUL 2004

**Dried Semi-Ready Meal**

The invention relates to a dry semi-ready meal packaged ready for preparing a meal featuring high sensorial quality. It also relates to a method of preparing the same.

Dry semi-ready meals (termed DSR meals in the following) consist of mixtures of dry or dried ingredients cooked by the consumer with the addition of a liquid, usually water, including, where necessary, the addition of oil and/or fat for quick production of a meal. "Cooking" in the sense of the present invention is intended to cover all typical types of preparation including not only cooking but also baking, frying, fritting, boiling, steaming, grilling, roasting and braising.

DSR meals contain one or more typical staple ingredients. In the sense of the present invention, staple ingredients are understood to be foodstuffs having a physiological effect such as, e.g., pasta, rice, cereals, potatoes, meat, vegetables, eggs, bread, milk, fruit, in contrast to other ingredients that stimulate taste, smell, appetite and nourishment such as e.g. herbs and spices. In addition conventional DSR meals may also contain such food additives as e.g. anti-oxidants, binding agents, emulsifiers, colorants, taste intensifiers, preservatives, modified starches, acidifiers, acidic regulators, stabilizers, sweeteners and thickeners. Further, conventional DSR meals mostly contain solid fats and flavorings.

DSR meals are marketed packaged, containing all ingredients in a mixture as necessary for preparation in water. Also available are so-called "instant" semi-ready meals which are pre-prepared in combination with fresh ingredients. However, such state of the art DSR meals may contain substances, the beneficial use of which is extremely controversial in modern nutritional physiological views. For a food item to comply with the requirements of EU bio Directive No. 2092/91, German AGÖL, and/or Bioland and/or Demeter associations and/or of the International Federation of Organic Agricultural Movements (IFOAM) and/or German organic and health food marking requirements, it must not contain chemically prepared organically-identical or artificial flavorings, or food additives –(except those as listed in

Attachment 1) or solid fats. The requirements of bio watchdog committees sometimes exceed EC directive 2092/91 by e.g., permitting the use of organic flavorings in food items verified by the association only when FTNF (From the Named Fruit) flavors. Because of DSR meals retailed by the food sector include flavorings, additives and solid fats, they are not recommended by modern nutritional advisory bodies .

Practically no DSR meals at all without these controversial ingredients are retailed in the food sector and only a few isolated products, e.g., instant soups or powdered potato meals, are offered in the organic and health food sector. DSR meals are primarily prepared at home. With the exception of powdered potato products, such DSR meals are not tasty. This being the reason why they are avoided by restaurants and organized catering services in business, schools and universities. Indeed, even eating places low on the scale of culinary excellence, such as rail and road fast food establishments usually make no use of DSR meals.

The invention is thus based on the object of making available DSR meals and a method for their preparation with which meals can now be prepared not only conveniently but also tasty to a degree as to now also find acceptance in restaurants and catering services while meeting modern advisory body requirements for healthy, balanced nutrition in keeping with pertinent national and international association standards.

It has been surprisingly discovered that meals of enhanced gustatorial and olfactory quality are now achievable by first dividing the mixture of dry or dried ingredients into a water phase and an oil phase before preparing the ready meal, particularly before cooking the staple ingredients. This is why for marketing such a DSR meal, the corresponding dispensed dry ingredients for a meal are now packaged in two separate batches.

The first batch is made up of the staple ingredients to be cooked in the water phase together with the spices and/or herbs and/or seasonings and/or additives for consistency. The second batch consists of one or more spices and/or herbs for dissolution in cooking oil and/or fat, and/or staple ingredients. Assigning the spices to the fat or water phase is such that

temperature-sensitive spices and herbs, i.e., those which must not be boiled, are assigned to the water phase - these include sensitive herbs and spices, vanilla, citrus fruits, berries, dried fruit and vegetables - whereas all other spices and herbs (fruit, seed, flower, bark and root spices and robust herbs and oilseeds) which are not temperature-sensitive are assigned to the oil phase. An assignment of various spices and seasonings to the oil phase or water phase, intended, however, merely to assist orientation, is given in Table 1.

Table 1 (1)

## Assignment of Spices or Seasonings to Water-Phase and/or Oil Phase

## Legend:

x = suitable

n = not suitable

a = relatively suitable (better result when assigned to fat phase)

b = relatively suitable (temperature-sensitive)

- = no use known

spices and seasonings	common name	botanic name	plant part used	treated	form	suitability for water phase	suitability for oil phase	pref. oil temperature
ajwain	Egyptian caraway	Carum copticum,	seed	dried	whole	a	x	170°C
		Trachyspermum ammi						
anise		Pimpinella anisum	seed	dried	ground	a	x	150°C
					whole	a	x	160°C
asafoetida	devil's dung	Ferula asafoetida	resin	dried	ground	a	x	140°C
basil		Ocimum basilicum	leaf	dried	grated	n	x	160°C
				freeze-dried	cut	x	b	
bear's garlic		Allium ursinum	leaf	dried	cut	x	b	
				freeze-dried	cut	x	b	
enugreek		Trigonella foenumgraecum	seed	dried	whole	a	x	160°C
summer savory		Satureja hortensis	leaf	dried	grated	x	b	
				freeze-dried	cut	x	b	

paprika powder	Capsicum annuum,	fruit w/wo seed	dried	whole	a	x	150°C
	Capsicum frutescens			coarse ground ground cut	a	x	140°C
			freeze- dried		a	x	120°C
	Turkish, paprika pepper		dried, roasted	coarse ground ground	a	x	150°C
	Cayenne pepper		dried	ground	x	b	140°C
curry leaves	Murraya koenigii	leaf	dried	whole	x	b	
				cut	x	b	
dill	Anethum sowa, Anethum graveolens	seed	dried	whole	a	x	160°C
				ground	a	x	140°C
		leaf	dried	whole	x	n	
	dill tips		freeze- dried	cut	x	n	
tarragon	Artemisia dracuncul	leaf	dried	cut	x	n	
			freeze- dried	cut	x	n	
fennel	Foeniculum vulgare	seed	dried	whole	a	x	160°C
				ground	a	b	
greater galangal	Alpina galanga	root	dried	ground	x	n	
pomegranate seeds	Punica granatum	seed with fruit pulp	dried	whole	x	n	
				ground	x	n	
roselle	Hibiscus sabdariffa	flower	dried	whole	x	n	
				cut	x	n	

ginger	Zingiber officinalis	root	dried	cut	a	x	150°C
			freeze-dried	ground cut	a	x	140°C
black cumin	kala jeera	seed	dried	whole	a	x	140°C
				ground	a	x	130°C
green cardamom	Elettaria kardamomum	capsule w. seed	dried	whole	x	x	170°C
				ground	a	x	140°C
		seed	dried	whole	a	x	160°C
				ground	a	x	140°C
brown cardamom	Amomum subulatum	capsule w. seed	dried	whole	a	-	
chervil	Anthriscus cerefolium	leaf	dried	grated	x	n	
			freeze-dried	cut	x	n	
garlic	Allium sativum		dried	ground	x	b	
				cut	x	b	
			freeze-dried	cut	x	n	
coriander	Coriandrum sativum	seed	dried	whole	n	x	160°C
				coarse	a	x	150°C
				ground	a	x	140°C
		leaf	dried	grated	x	n	
			freeze-dried	cut	x	n	
cumin	Cuminum cyminum	seed	dried	whole	a	x	160°C
				ground	a	x	140°C
caraway	Carum carvi	seed	dried	whole	x	x	140°C
				ground	x	x	130°C
tumeric	Curcuma longa	root	dried	ground	x	x	150°C
lavender	Lavendula officinalis	flower	dried	whole	x	n	

lemon grass	lemon grass	Cymbopogon citratus	leaf	dried	cut	x	n	
				freeze-dried	cut	x	n	
Lovage	Maggikraut	Levisticum officinale	leaf	dried	grated	x	b	
				freeze-dried	cut	x	b	
laurel		Laurus nobilis,	leaf	dried	whole	x	x	150°C
		Cinnamomum lamala, C. obtusifolium						150°C
					cut	x	x	
marjoram		Origanum majorana	leaf	dried	ground	x	b	
				freeze-dried	grated	x	b	
mango		Mangifera indica	green fruit	dried	cut	x	n	
			pulp		ground			
mint	peppermint	Mentha piperita	leaf	dried	grated	x	n	
	spearmint	Mentha spicata						
	frizzy mint	crispa						
	etc.	etc.						
poppy	white	Papaver somniferum	seed	dried	ground	a	x	150°C
nutmeg		Myristica fragans	flower	dried	ground	x	x	140°C
			nut	dried	ground	x	x	120°C
cloves		Caryophyllus aromaticus	flower	dried	whole	a	x	160°C
					ground	a	x	140°C
orange		Citrus sinensis	peel	dried	cut	x	n	
					ground	x	n	
oregano		Origanum vulgare	leaf	dried	grated	x	b	
				freeze-dried	cut	x	b	

paprika	mild sweet	Capsicum annuum	fruit	dried	ground cut	x	x	120°C
	hot			dried	ground cut	a	x	130°C
parsley		Petroselinum crispum	leaf	dried	grated	x	n	120°C
				freeze-dried	cut	x	n	130°C
pepper	green	Piper nigrum	berries	dried	whole	x	n	
				freeze-dried	whole	x	n	
	black			dried	whole	x	x	160°C
					coarse ground	x	x	150°C
					ground	x	x	140°C
				freeze-dried	whole	x	b	
					coarse ground	x	b	
	white			dried	whole	x	x	150°C
					coarse ground	x	x	140°C
					ground	x	x	130°C
				freeze-dried	whole	x	b	
					coarse ground	x	b	
pepper	rose	Schinus molle	berries	dried	whole	x	n	
pimenta	clove pepper	Pimenta officinalis kannada	berry	dried	whole	x	x	150°C
					ground	x	x	140°C
rosemary		Rosmarinus officinalis	leaf	dried	cut	x	b	
				freeze-dried	whole	x	b	
					cut	x	b	



saffron		Crocus sativus	stigma	dried	whole	x	n	
sage		Salvia officinalis	leaf	dried	ground	x	n	
				freeze-dried	cut	x	b	
sandalwood		Santalum album	wood	dried	cut	x	b	
chives			leaf	dried	ground	x	-	
				freeze-dried	cut	x	n	
black cumin		Nigella sativa	seed	dried	whole	x	n	150°C
				dried	ground	x	x	130°C
celery			seed	dried	whole	a	x	160°C
				dried	ground	a	x	140°C
mustard	yellow	Sinapis alba	seed	dried	whole	x	n	
				dried	ground	x	n	
mustard	brown or black	Brassica juncea, Brassica nigra	seed	dried	whole	a	x	170°C
				dried	ground	x	x	150°C
star anise		Illicium verum	fruit with seed	dried	whole	x	x	160°C
				dried	ground	x	x	140°C
thyme		Thymus vulgaris	leaf	dried	grated	x	b	
				freeze-dried	cut	x	b	
vanilla		Vanilla planifolia	fruit	dried	ground	x	n	
juniper		Juniperus communis	berry	dried	whole	x	b	
				dried	ground	x	b	
cinnamon	Ceylon cinnamon	Cinnamomum zeylanicum	bark	dried	whole	a	x	170°C
				dried	cut	a	x	160°C
				dried	ground	a	x	150°C

cinammon	cassia	Cinnamomum cassia	bark	dried	cut	a	x	160°C
lemon		Citrus limon	peel	dried	cut	a	x	150°C
					ground	x	n	
berries	strawberry	Fragaria ananassa	berry	dried		x	n	
	raspberry	Rubus idaeus		or				
	currants	Ribes rubrum (nigrum)		freeze-dried				
	tomato	Lycopersicon esculentum						
	etc.							
oil seeds	sesame	Sesamum indicum	seed	dried		x	x	140°C
	sunflower	Helianthus annuus						
	pumpkin seeds	Cucurbita						
	poppy	Papaver somniferum						
	etc.							
dried fruit	apples	Pyrus malus	fruit	dried		x	n	
	banana	Musaceae						
	apricots	Prunus aemeriaca						
	dates	Phoenix avium						
	figs	Ficus carica						
	cherries	Prunus domestica						
	currants	Vitis vinifera Agyrena						
	prunes	Prunus domestica						
	raisins	Vitis vinifera						
	morellos	Prunus cerasus						
	sultanas	Vitis vinifera						
	grapes	Vitis vinifera						
	etc.							

dried vegetables	carrots leek parsnip onions shallots parsley onions etc.	Daucus carota Allium porrum Pastinaca sativa Allium cepa Allium ascalonicum Petroselinum crispum Allium cepa	leaf, root	dried or freeze- dried or spray- dried	x	n
other spices and seasonings	meat and meat extract fish and fish extract cheese yeast soy sauce dairy products etc.			dried or freeze- dried or spray- dried	x	n

dried mushrooms	yellow boletus	Boletus edulis, B. pinicola, B. aereus, B. aestivalis Cantharellus cibarius Agaricus arvensis, A. silvatica, A. campestris, A. bispora Pleurotus ostreatus Lentinus edodes	head and stalk	dried or freeze-dried	whole cut ground	x	b
	chanterelle mushroom						
	oyster mushroom shiitake mushroom						

Since with spices and herbs, the temperature for optimum release of taste in the oil phase depends on their degree of size reduction in each case (e.g., a higher oil temperature being required for whole spices than when finely ground) in a combination of herbs and spices their degree of size reduction (whole - coarse - fine) needs to be adapted individually so that optimum release of taste occurs in each case at the same oil temperature, where possible.

When heating the oil phase, the ingredients dissolving in fat define the characteristic taste of the meal in each case, especially from their essential oils and/or hot pungent substances (including, among others, piperine, capsaicin, mustard oils, alliine) passing into the cooking oil and/or fat in flavoring it. Where necessary, fresh ingredients, especially the staple ingredients, but also herbs and/or vegetables may be added to a ready dry mixture. If these are not temperature-sensitive and can be assigned to the oil phase, they may be coated with flavored oil.

In the water phase, the staple ingredients are cooked and spices and/or herbs are absorbed along with such taste and smell enhancing ingredients (essential oils, bitters, hot pungent substances) that on mixing with the flavored oil phase of the meal being prepared, in each case create the desired typical gustatorial and olfactory overall impact by enhancing the inherent taste and smell of the staple ingredients.

The spices and/or herbs for absorption in the oil phase are mixed and heated by the consumer with cooking oil and/or fat available at home. The spices and/or herbs may be mixed with the oil and/or fat prior to heating or the oil and/or fat may be first heated and then the spices and/or herbs added. By the essential oils dissolving in the fat and the hot pungent ingredients passing into the oil and/or fat, the latter is flavored. This action is complete as soon as the flavorings dissolved in the oil and/or fat release a perceptible aroma either as key components or as an impact compound.

A volatile compound is termed an impact compound when it alone produces the typical flavor impact of a spice, whereas when several separate compounds are responsible therefor, they are termed key components.

If only spices and/or herbs are sauteed, just a few seconds in hot oil and/or fat are sufficient at a temperature in the range 120°C to 170°C. If fresh staple ingredients are sauteed, 30 secs. to 5 minutes are sufficient. There is no need for the oil/fat temperature to be measured in preparation, actual kitchen practice has shown that it is sufficient to take care that the spices and/or herbs are clearly perceptible by smell and the mixture is not overheated (to more than 180°C). Allowing the oil and/or fat to smoke or even boil must be avoided. This can result in unhealthy trans fatty acids, undesirable roasted substances with the danger of oil and/or fat spattering on when adding water.

All other ingredients, particularly the staple ingredients are mixed with water and cooked in the aqueous phase. The water phase is added to the flavored oil and/or fat. Mixing of the remaining ingredients with water can be done prior to adding the water phase to the flavored oil phase. Or a metered amount of water is added to the flavored oil phase before adding the remaining ingredients. The meal is then cooked until the staple ingredients are done.

Flavoring the cooking oil and/or fat as the first step is suitable for most recipes. Following release of the ingredients broken down in the oil phase, cooking up to 10 minutes in water will not produce any further tangible change in the degree of extraction of the inherent fat soluble essential oils and/or hot pungent substances.

Where meals are concerned having staple ingredients that need to be cooked longer in the water phase, such as legumes, whole-meal wheat, brown rice, it may be advantageous to first cook them in the water phase together with the further ingredients for the water phase and to add the flavored oil phase when done. This prevents bitters and other substances affecting the taste and/or smell contained in the ingredients for the oil phase or formed in lengthy cooking from passing into the water phase during cooking. Following the addition of the flavored oil phase when done, the meal is then left to stand for a further 5 minutes or so for an intimate intermingling of aromas and flavorings.

Since in accordance with the invention the spice and/or herb mixture for breakdown in the oil phase are packaged separate from the staple ingredients to be cooked in the

water phase, the producer of the DSR meals in accordance with the invention has the possibility of offering the oil phase already flavored with the spice and/or herb mixture apportioned for a specific meal separately packaged. The flavored oil in a suitable package then merely needs to be added to the remaining ingredients at the desired point in time.

Suitable for this purpose is, e.g., a plastic-finished bag of aluminum foil as used for apportioned packs of ketchup or mustard, or a glass vial as usual for bakery flavorings. Also suitable are one or more gelatin or starch capsules as usual for swallowing medicines and that have the advantage that they dissolve on cooking in adding body to the meal. Likewise suitable is a herbal drop containing a filling of spice and/or herbal extracts, or a closed salt crystal likewise containing a filling of spice and/or herbal extracts which have the advantage of dissolving on cooking in making use of the sugar or salt shell for flavoring the meal.

The method in accordance with the invention for the preparation of meals from the DSR meals in accordance with the invention now makes it possible to produce DSR meals with the total elimination of all and any controversial, undesirable, particular chemically modified food additives while nevertheless preparing a meal that in its overall sensorial impact and from a nutritional physiological point of view is practically identical to that of a meal prepared with fresh ingredients. In addition, the labor in developing recipes is relatively low as compared to that of conventional DSR meals since recourse can now be made to traditional cooking recipes having a proven record of success. This is why meals prepared with DSR ingredients in accordance with the invention satisfy the culinary requirements of high-profile catering establishments or restaurants while complying with EU bio directive (EEC Directive No. 2092/91) and organic and/or health food guideline requirements. When dispensing with compliance with such requirements, then instead of flavored cooking oil, flavored or plain solid fat may be employed. This still allows meals to be prepared with a convincing taste and, in this case, there is no need for separate packaging.

The invention will now be detailed by way of the following examples:

## Example 1

Red lentils with spices (Bengali masar dal)

The composition of the (dried) staple ingredients and spices of the first separate packaged batch for cooking in water is as follows:

Red lentils (masar dal)	225 g
Tomato powder (spray dried)	12 g
Salt	8.25 g
Cane sugar	0.5 g
Paprika, hot, ground	1.7 g
Paprika, mild sweet, ground	1.4 g
Ginger, ground	1 g
Tumeric, ground	0.65 g
Garlic, freeze-dried	0.75 g
Onions, freeze-dried	0.55 g
Parsley, freeze-dried	0.32 g
Bay-leaf	1/2 piece

The composition of the spices and/or herbs of the second batch packaged separate for absorption in cooking oil is as follows:

Cumin, whole	0.9 g
Fennel, whole	0.9 g
Black mustard, whole	0.9 g
Black cumin, whole	0.45 g
Fenugreek, whole	0.45 g
Cinnamon pieces	0.25 g

The spice mixture of the second batch for the oil phase is added to two tablespoonfuls of cooking oil and heated; optionally the two tablespoonfuls of cooking oil are first heated and then the spice mixture added. Heat is applied until the spices release their odor,



then 780 ml of water is added to the hot flavored oil phase. Then, the mixture of the first batch with the staple ingredients is added, stirred, brought to boil and left to simmer for 20 minutes with occasional stirring.

Since the staple ingredient is a legume requiring a somewhat longer cooking time, in a preferred embodiment, the first batch for the water phase is first boiled in water for a period of 15 minutes before adding the flavored oil phase and leaving to simmer for further 5 minutes.

## Example 2

### Fine basmati rice (paliaala pilaw)

The composition of the (dried) staple ingredients and spices of the first separate packaged batch for cooking in water is as follows:

Basmati rice	225 g
Salt	8.25 g
Cane sugar	0.5 g
Onions, freeze-dried	1.1 g
Tumeric, ground	0.65 g
Garlic, freeze-dried	0.75 g
Bay-leaf	1/2 piece

The composition of the spices and/or herbs of the second batch packaged separate for absorption in cooking oil is as follows:

Cumin	0.3 g
Cloves	4 pieces
Cinnamon stick	3 cm
Green cardamom, whole capsules	4 pieces

Two tablespoonfuls of cooking oil are added to the spice mixture of the second batch for the oil phase and heated; optionally the two tablespoonfuls of cooking oil are first heated and then the spice mixture added. Heat is applied until the spices release their odor, then 620 ml of water is added to the hot flavored oil phase. Then, the rice mixture is added, stirred, brought to boil and left to simmer for 10 minutes with the lid on. This is followed by leaving to finish for a further 10 minutes on a low flame before the meal is removed from the flame, left to stand for 5 minutes and fluffed with a fork.

For makers of DSR meals in accordance with the invention there is now the possibility of developing new ranges of products to advantage as were formerly hardly achievable with conventional DSR meals.

- Restaurant owners hitherto unable to offer higher quality vegetarian food can now offer instant vegetarian dishes.
- Catering services can now install vending machines for obtaining meals of high nutritional physiological value.
- Relatively unknown, but good-tasting legumes of high nutritional physiological value (French green lentils, belugal lentils, champagne lentils, mountain lentils, toor dal peas, channa dal peas, azuiki beans, pinto beans and a whole lot more) can now be packaged as DSR meals together with suitable spices and/or herbs.
- New fillers of cooked varieties of cereals (spelt, kamut, barley, oats, green core, wheat) or unusual varieties (amaranth, buckwheat, barley, millet, maize, quinoa) can now be packaged together with suitable spices and/or herbs for appropriately extending dishes on offer in also rendering them to full value nutritionally.
- Classical international dishes requiring sophisticated spices normally not available as household spices can now be prepared more conveniently and with more certainty.
- Soy extrudate meat-replacement meals are now achieved as DSR meals.
- DSR meals suitable for diet schedules can now be developed, necessary e.g. with such afflictions as diabetes mellitus, hypercholesterolemia, hypertriglyceridemia, hypertonia, gout, coeliac/ceeliac disease.
- DSR recipes can now be adjusted to meet the particular nutritional needs as medically recommended for such groups as active sports enthusiasts and

WO 03/059780

professionals, expectant and nursing mothers, vegetarians requiring a special or enhanced intake of specific amino acids, vitamins and minerals.

- DSR based ayurvedic recipes can now be made available.